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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,447	04/12/2006	Christian Muller	NITROF P65AUS	2084
20210 7590 09/12/2008 DAVIS BUJOLD & Daniels, P.L.L.C. 112 PLEASANT STREET CONCORD, NH 03301				
EXAMINER				
DOERRLER, WILLIAM CHARLES				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
09/12/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/575,447

**Applicant(s)**

MULLER ET AL.

**Examiner**

William C. Doerrler

**Art Unit**

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 21-25 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_
- Paper No(s)/Mail Date 4-12-2006

**DETAILED ACTION**

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In both claims, "said U or C shapes" lacks clear antecedent basis.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4,7,9-11,15 and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by DeGregoria et al (5,249,424).

DeGregoria shows a device for generating thermal flux having magneto-caloric elements 31,32,35 and 36 and magnets 33 and 37. The magnets are moved reciprocally (see figures 3-6) to produce entropy changes in the magneto-caloric material. The heat is transferred through a fluid being pumped through the magneto-

caloric material to a heating heat exchanger 46 and a cooling heat exchanger 57. In regard to claim 4, figures 3 and 4 show the heat transfer fluid traveling in different directions in different portions of the cycle. In regard to claim 7, it is noted that the GdNi used as magneto-caloric material in DeGregoria et al comprising Gd. In regard to claim 9, the heat transfer fluid passes through channels 142 through the magneto-caloric material.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5,6,8,12-14,16-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGregoria et al in view of Zimm et al (6,668,560).

DeGregoria et al discloses applicants' basic inventive concept, a magnetic cooling system that moves magnets reciprocally in relation to magneto-caloric material to produce cooling, substantially as claimed with the exception of using a hot and cold circuit with synchronization means to control the flow of heat transfer fluid through the magneto-caloric material to provide controlled heating and cooling and to use C shaped magnets. Zimm et al show valves 71-74 which are synchronized with each other and with the movement of the magnet to control the flow of heat transfer fluid to ensure proper heat flow in the system and iron section 42 which forms a C shape with permanent magnet 40 to maximize the magnetic flux passing through the magneto caloric material which is formed in areas with gaps between to reduce heat transfer between different sections of magneto-caloric material. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Zimm et al to modify the magnetic cooling system of DeGregoria et al by using synchronized flow of heat transfer fluid to ensure proper flow of heat transfer through the magneto-caloric material and to use a C-shaped magnet to increase the magnetic flux passing through the magneto-caloric material to improve the cooling effect. In regard to claim 8, neither reference states what material is used to contain the magneto-caloric material. However, copper, aluminum and steel are the most common materials for heat transfer devices, and as such would have been obvious to an ordinary practitioner in the art due to their availability, relative economy and heat transfer characteristics. In regard to claims 17 and 18, orientation of the thermal bodies relative to the axis of the magnets is considered to be a matter of design choice to an ordinary

practitioner in the art, which will not appreciably effect the cooling produced. The fact that applicant has claimed both perpendicular and parallel configurations is seen as evidence that the configuration is not critical to the effective functioning of the device. In regard to claim 19, DeGregoria shows rectilinear translation of the magnet means and Zimm et al show straddling the thermal bodies with the magnets. Frames and Bars are considered obvious to move a series of objects relative to each other in a safe and controlled manner.

#### ***Allowable Subject Matter***

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ghoshal shows a magnetic cooling system. Wade et al, Bennett et al, Hed, Nakagame et al, Johnson and Barclay et al show magnetic refrigerators with reciprocating motion between the magnets and the magneto-caloric material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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